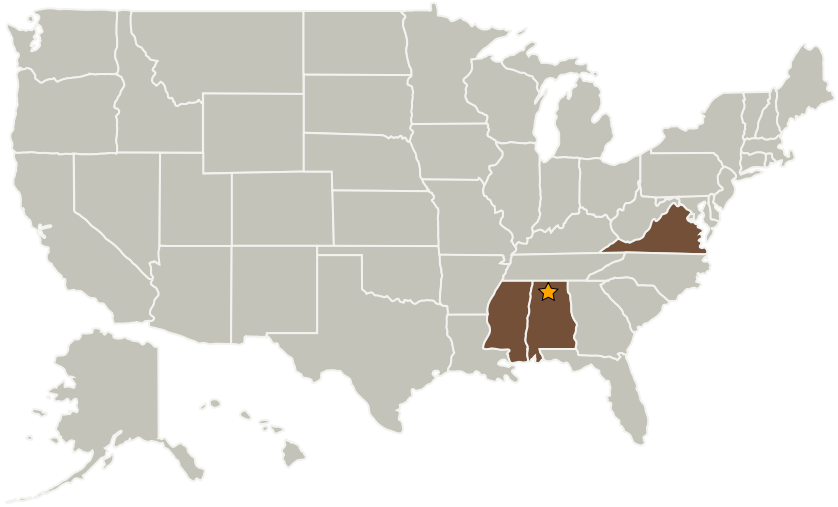
High-Frequency Flush Mounted Miniature LOX Fiber-Optic Pressure Sensor, Phase I

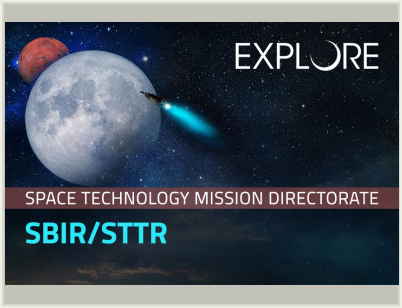
Completed Technology Project (2004 - 2005)

Project Introduction

Luna Innovations is teaming with the University of Alabama, Huntsville, to develop a miniature flush-mounted fiber-optic pressure sensor that will allow accurate, high-frequency high-pressure measurement of LOx and LH2. The Innovation of this system is that the sensor is not intrusive, will not interfere with the flow field, and is a novel adaptation of proven technology. To insure compatibility with the LOx environment, the sensor will be constructed from metal-oxides, ceramics and other materials that are intrinsically safe. The sensor will help engineers optimize performance of liquid fueled rocket engines for the next generation of reusable lift vehicles, and flight versions of the sensors will enable real-time monitoring and control of the engines, improving safety and enabling commercialization of space. During the Phase I, a prototype sensor will be designed and tested to verify feasibility. Materials and bonds will be tested to insure compatibility with LOx. During the Phase II, optimized sensors will be constructed and extensive tests conducted to advance the technology to pre-production status. This system meets NASA?s goals by providing LOx and LH2 pressure data while: 1) minimizing intrusion, 2) improving reliability, 3) having fast response time, and 4) being intrinsically safe.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Marshall Space Flight Center (MSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Marshall Space Flight Center(MSFC)	Lead Organization	NASA Center	Huntsville, Alabama
Luna Innovations, Inc.	Supporting Organization	Industry	Roanoke, Virginia

Primary U.S. Work Locations	
Alabama	Mississippi
Virginia	

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Rex Chamberlain

Technology Areas

Primary:

- TX13 Ground, Test, and Surface Systems
  - TX13.1 Infrastructure Optimization
    - TX13.1.3 Commodity Recovery